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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/936,787	12/12/2001	Moshe Levin	111212.00102	9496
27557	7590	01/13/2005	EXAMINER	
BLANK ROME LLP 600 NEW HAMPSHIRE AVENUE, N.W. WASHINGTON, DC 20037			TRAN, MAI T	
			ART UNIT	PAPER NUMBER
			2121	

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/936,787		LEVIN ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Mai T. Tran		2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/12/01.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4 and 5 is/are rejected.
- 7) ☒ Claim(s) 3 and 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This Office Action is responsive to application 09936787, filed December 12, 2001.

Claims 1-6 have been examined.

#### **Claim Rejections - 35 USC § 101**

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-6 are rejected under 35 U.S.C. 101 because the claimed invention recites mathematical algorithm without any limitation to a practical application. Therefore, the claimed invention is non-statutory. To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 as being nonstatutory above are further rejected as set forth below in anticipation of applicant amending these claims to overcome the rejection under 35 U.S.C. 101.

#### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2 and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Optimal camera placement to obtain accurate 3D point positions" by Olague et al hereafter Olague, and further in view of "Optimization by Simulated Annealing" by Kirkpatrick et al hereafter Kirkpatrick.

#### **Claim 1**

Olague teaches a method for determining locations and angular orientations of a set of cameras to cover a predetermined volume, the method comprising:

- a) determining a number of said cameras (col. 1, lines 2-3);
- b) determining at least one intermediate solution through a genetic algorithm (col. 3, line 42); and
- c) determining a solution from the at least one intermediate solution through a simulated annealing algorithm.

Olague fails to teach how to determine a solution from the at least one intermediate solution through a simulated annealing algorithm. Kirkpatrick teaches an optimization technique by simulated annealing. This method differs

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from iterative improvement in that the procedure needs not get stuck since transitions out of a local optimum are always possible at nonzero temperature. Therefore, it would have been obvious to a person having ordinary skill in the art at the time of applicant's invention to combine Olague in view of Kirkpatrick for the purpose of avoiding to become trapped at local minima.

#### **Claim 2**

Olague teaches the method of claim 1, wherein step (b) comprises:

- i) determining a plurality of random initial solutions (col.4, line 1);
- ii) performing a local search around each of the random initial solutions to find a locally optimized solution (col. 4, lines 3-4);
- iii) applying a random mutation to each of the locally optimized solutions to obtain a mutated solution (col. 4, line 10);
- iv) recombining the mutated solutions to obtain recombined solutions (col.4, line 8);
- v) sorting the recombined solutions by coverage level (col. 4, line 14-15); and
- vi) selecting a number of the recombined solutions having the highest coverage levels for the simulated annealing algorithm (col. 4, line 14-15).

#### **Claim 4**

Olague teaches the method of claim 1, wherein step (b) comprises using the genetic algorithm to optimize the number of cameras determined in step (a) (col. 3, line 42).

**Claim 5**

Olague teaches the method of claim 4, wherein step (b) comprises:

- i) determining a plurality of random initial solutions, each using the number of cameras determined in step (a) (col. 4, line 1);
- ii) performing a local search around each of the random initial solutions to find a locally optimized solution (col. 4, lines 3-4);
- iii) applying a random mutation to each of the locally optimized solutions to obtain a mutated solution, the random mutation comprising a random mutation in the number of cameras in each of the locally optimized solutions (col. 4, line 10);
- iv) recombining the mutated solutions to obtain recombined solutions (col. 4, line 8);
- v) sorting the recombined solutions by coverage level (col. 4, lines 14-15); and
- vi) selecting a number of the recombined solutions having the highest coverage levels for the simulated annealing algorithm (col. 4, lines 14-15).

**Allowable Subject Matter**

Claims **3 and 6** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter in **claim 3**: the cited prior art does not disclose calculating a coverage level of the new solution in combination with all of the limitations of claim 3 and claims 1 and 2.

The following is a statement of reasons for the indication of allowable subject matter in **claim 6**: the cited prior art does not disclose a solution that would address the situation where two of the mutated solutions having different numbers of cameras are to be recombined.

### **Conclusion**

The following is prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

1. Shaefer, U.S. Patent No. 5,222,192
2. Wooster et al, U.S. Patent No. 6,023,680
3. Ciccolo et al, U.S. Patent No. 6,449,382
4. "Genetic algorithm approach to camera calibration in 3D machine vision"  
by M. Roberts and A. J. Naftel, IEE Colloquium (Digest) n 193 1994.

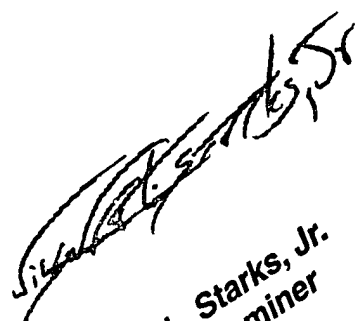
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mai T. Tran whose telephone number is (571) 272-4238. The examiner can normally be reached on M-F 8:30am -- 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on (571) 272-3687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

M.T.T  
Patent Examiner  
Date: 12/28/04



Wilbert L. Starks, Jr.  
Primary Examiner  
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